



# 3350 Direct Access Storage, Models A2, A2F, B2, B2F, C2, C2F

## Reference Summary

GX20-1983-0

First Edition (January 1977)

The capacity table and the speed and capacity data in this reference summary card are based on information in *Reference Manual for IBM 3350 Direct Access Storage* (GA26-1638). This card will be updated from time to time, but GA26-1638 is the authoritative source and will be the first to reflect changes.

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## Speed

|                                |                |
|--------------------------------|----------------|
| Seek time*                     |                |
| Cylinder to cylinder . . . . . | 10 ms          |
| Average . . . . .              | 25 ms          |
| Maximum . . . . .              | 50 ms          |
| Data rate . . . . .            | 1198 KB/second |
| Latency                        |                |
| Minimum . . . . .              | .0 ms          |
| Average . . . . .              | 8.4 ms         |
| Maximum . . . . .              | 16.7 ms        |

\*The fixed heads on Models A2F, B2F and C2F provide up to 1.144 million bytes of zero-seek-time storage per drive.

## Capacity

|                           | Native Mode                  | Compatibility Modes                            |                              |
|---------------------------|------------------------------|------------------------------------------------|------------------------------|
|                           |                              | 3330-1                                         | 3330-11                      |
| Logical volumes per drive | 1                            | 2                                              | 1                            |
| Cylinders per drive       | 555 (plus 5 alternates)      | 404 per logical volume (plus 7 alternates)     | 808 (plus 7 alternates)      |
| Tracks per cylinder       | 30                           | 19                                             | 19                           |
| Tracks per drive          | 16,650 (plus 150 alternates) | 7,676 per logical volume (plus 133 alternates) | 15,352 (plus 133 alternates) |
| Track capacity (bytes)    | 19,069                       | 13,030                                         | 13,030                       |
| Cylinder capacity (bytes) | 572,070                      | 247,570                                        | 247,570                      |
| Drive capacity (bytes)    | 317.5 million                | 100 million per logical volume                 | 200 million                  |

## Fixed Head Storage Capacity — Models A2F, B2F, C2F

The fixed head storage capacity takes the place of an equal amount of storage under the moving heads.

|                             | Native Mode      | Compatibility Modes |                  |
|-----------------------------|------------------|---------------------|------------------|
|                             |                  | 3330-1*             | 3330-11          |
| Logical cylinders           | 2 (Nos. 1 - 2)   | 3 (Nos. 1 - 3)      | 3 (Nos. 1 - 3)   |
| Tracks per logical cylinder | 30 (Nos. 0 - 29) | 19 (Nos. 0 - 18)    | 19 (Nos. 0 - 18) |
| Drive capacity (bytes)      | 1,144,140        | 742,710             | 742,710          |
| Unit capacity (bytes)       | 2,288,280        | 1,485,420           | 1,485,420        |

\*In 3330-1 Compatibility Mode, fixed head storage is associated with the first of the two logical volumes.

## Records per Track

The number of equal-length records that can be contained on one track depends on track capacity and record size. It can be calculated through use of the following formulas, which take into consideration the home address, R0 space, and skip defect allowance (overhead).

### 3350 Native Mode

In this mode the number of equal-length records per track\* is:

$$\frac{19,254}{KL + DL + C} \quad \begin{array}{l} \text{(bytes per track)} \\ \text{(bytes per record)} \end{array}$$

where:

KL = key length  
DL = data length  
C (overhead per record)  
= 185 if KL = 0  
267 if KL ≠ 0

### 3330-1 and 3330-11 Compatibility Modes

In these modes the number of equal-length records per track\* is:

$$\frac{13,165}{KL + DL + C} \quad \begin{array}{l} \text{(bytes per track)} \\ \text{(bytes per record)} \end{array}$$

where:

KL = key length  
DL = data length  
C (overhead per record)  
= 135 if KL = 0  
191 if KL ≠ 0

\*For the number of unequal-length records per track see "Track Capacity" in *Reference Manual for IBM 3350 Direct Access Storage* (GA26-1638).

## Use of Table

Following are some examples of how the capacity table may be used. In the table, "records" refers to physical records.

- Assume 142-byte logical records to be recorded unblocked (data length = 142) and without keys. The table indicates that 58 records can be placed on each track (1740 on each cylinder and 965,700 on each drive). Reducing the record length by 1 byte permits 59 records per track, an increase of 16,650 records per drive. Alternatively, the record length can be increased by 4 bytes without decreasing the number of records per drive.
- To see the effect of blocked records, assume the same 142-byte logical records are to be recorded without keys. Also assume a blocking factor of 20 (data length = 2840). The table indicates that 6 physical records can be written on each track for a total of 120 logical records per track (compared with 58 logical records if unblocked).
- Assume 100-byte logical records, unblocked, and formatted with keys (data length = 100, key length = 8). The number to look up in the "with key" part of the table is 108 (key length + data length). There will be 51 records per track.

## Capacity Table — Native Mode

| Bytes per Record |       |           |       | Number of Records |              |           |
|------------------|-------|-----------|-------|-------------------|--------------|-----------|
| Without Keys     |       | With Keys |       | Per Track         | Per Cylinder | Per Drive |
| Min.             | Max.  | Min.      | Max.  |                   |              |           |
| 9443             | 19069 | 9361      | 18987 | 1                 | 30           | 16650     |
| 6234             | 9442  | 6152      | 9360  | 2                 | 60           | 33300     |
| 4629             | 6233  | 4547      | 6151  | 3                 | 90           | 49950     |
| 3666             | 4628  | 3584      | 4546  | 4                 | 120          | 66600     |
| 3025             | 3665  | 2943      | 3583  | 5                 | 150          | 83250     |
| 2566             | 3024  | 2484      | 2942  | 6                 | 180          | 99900     |
| 2222             | 2565  | 2140      | 2483  | 7                 | 210          | 116550    |
| 1955             | 2221  | 1873      | 2139  | 8                 | 240          | 133200    |
| 1741             | 1954  | 1659      | 1872  | 9                 | 270          | 149850    |
| 1566             | 1740  | 1484      | 1658  | 10                | 300          | 166500    |
| 1420             | 1565  | 1338      | 1483  | 11                | 330          | 183150    |
| 1297             | 1419  | 1215      | 1337  | 12                | 360          | 199800    |
| 1191             | 1296  | 1109      | 1214  | 13                | 390          | 216450    |
| 1099             | 1190  | 1017      | 1108  | 14                | 420          | 233100    |
| 1019             | 1098  | 937       | 1016  | 15                | 450          | 249750    |
| 948              | 1018  | 866       | 936   | 16                | 480          | 266400    |
| 885              | 947   | 803       | 865   | 17                | 510          | 283050    |
| 829              | 884   | 747       | 802   | 18                | 540          | 299700    |
| 778              | 828   | 696       | 746   | 19                | 570          | 316350    |
| 732              | 777   | 650       | 695   | 20                | 600          | 333000    |
| 691              | 731   | 609       | 649   | 21                | 630          | 349650    |
| 653              | 690   | 571       | 608   | 22                | 660          | 366300    |
| 618              | 652   | 536       | 570   | 23                | 690          | 382950    |
| 586              | 617   | 504       | 535   | 24                | 720          | 399600    |
| 556              | 585   | 474       | 503   | 25                | 750          | 416250    |
| 529              | 555   | 447       | 473   | 26                | 780          | 432900    |
| 503              | 528   | 421       | 446   | 27                | 810          | 449550    |
| 479              | 502   | 397       | 420   | 28                | 840          | 466200    |
| 457              | 478   | 375       | 396   | 29                | 870          | 482850    |
| 437              | 456   | 355       | 374   | 30                | 900          | 499500    |
| 417              | 436   | 335       | 354   | 31                | 930          | 516150    |
| 399              | 416   | 317       | 334   | 32                | 960          | 532800    |
| 382              | 398   | 300       | 316   | 33                | 990          | 549450    |
| 366              | 381   | 284       | 299   | 34                | 1020         | 566100    |
| 350              | 365   | 268       | 283   | 35                | 1050         | 582750    |
| 336              | 349   | 254       | 267   | 36                | 1080         | 599400    |
| 322              | 335   | 240       | 253   | 37                | 1110         | 616050    |
| 309              | 321   | 227       | 239   | 38                | 1140         | 632700    |
| 297              | 308   | 215       | 226   | 39                | 1170         | 649350    |
| 285              | 296   | 203       | 214   | 40                | 1200         | 666000    |
| 274              | 284   | 192       | 202   | 41                | 1230         | 682650    |
| 263              | 273   | 181       | 191   | 42                | 1260         | 699300    |
| 253              | 262   | 171       | 180   | 43                | 1290         | 715950    |
| 243              | 252   | 161       | 170   | 44                | 1320         | 732600    |
| 234              | 242   | 152       | 160   | 45                | 1350         | 749250    |
| 225              | 233   | 143       | 151   | 46                | 1380         | 765900    |
| 217              | 224   | 135       | 142   | 47                | 1410         | 782550    |
| 208              | 216   | 126       | 134   | 48                | 1440         | 799200    |
| 201              | 207   | 119       | 125   | 49                | 1470         | 815850    |
| 193              | 200   | 111       | 118   | 50                | 1500         | 832500    |

## Capacity Table (cont'd.)

| Bytes per Record |      |           |      | Number of Records |              |           |
|------------------|------|-----------|------|-------------------|--------------|-----------|
| Without Keys     |      | With Keys |      | Per Track         | Per Cylinder | Per Drive |
| Min.             | Max. | Min.      | Max. |                   |              |           |
| 186              | 192  | 104       | 110  | 51                | 1530         | 849150    |
| 179              | 185  | 97        | 103  | 52                | 1560         | 865800    |
| 172              | 178  | 90        | 96   | 53                | 1590         | 882450    |
| 166              | 171  | 84        | 89   | 54                | 1620         | 899100    |
| 159              | 165  | 77        | 83   | 55                | 1650         | 915750    |
| 153              | 158  | 71        | 76   | 56                | 1680         | 932400    |
| 147              | 152  | 65        | 70   | 57                | 1710         | 949050    |
| 142              | 146  | 60        | 64   | 58                | 1740         | 965700    |
| 136              | 141  | 54        | 59   | 59                | 1770         | 982350    |
| 131              | 135  | 49        | 53   | 60                | 1800         | 999000    |
| 126              | 130  | 44        | 48   | 61                | 1830         | 1015650   |
| 121              | 125  | 39        | 43   | 62                | 1860         | 1032300   |
| 116              | 120  | 34        | 38   | 63                | 1890         | 1048950   |
| 112              | 115  | 30        | 33   | 64                | 1920         | 1065600   |
| 107              | 111  | 25        | 29   | 65                | 1950         | 1082250   |
| 103              | 106  | 21        | 24   | 66                | 1980         | 1098900   |
| 99               | 102  | 17        | 20   | 67                | 2010         | 1115550   |
| 95               | 98   | 13        | 16   | 68                | 2040         | 1132200   |
| 91               | 94   | 9         | 12   | 69                | 2070         | 1148850   |
| 87               | 90   | 5         | 8    | 70                | 2100         | 1165500   |
| 83               | 86   | 4         | 4    | 71                | 2130         | 1182150   |
| 79               | 82   |           |      | 72                | 2160         | 1198800   |
| 76               | 78   |           |      | 73                | 2190         | 1215450   |
| 72               | 75   |           |      | 74                | 2220         | 1232100   |
| 69               | 71   |           |      | 75                | 2250         | 1248750   |
| 66               | 68   |           |      | 76                | 2280         | 1265400   |
| 62               | 65   |           |      | 77                | 2310         | 1282050   |
| 59               | 61   |           |      | 78                | 2340         | 1298700   |
| 56               | 58   |           |      | 79                | 2370         | 1315350   |
| 53               | 55   |           |      | 80                | 2400         | 1332000   |
| 50               | 52   |           |      | 81                | 2430         | 1348650   |
| 47               | 49   |           |      | 82                | 2460         | 1365300   |
| 45               | 46   |           |      | 83                | 2490         | 1381950   |
| 42               | 44   |           |      | 84                | 2520         | 1398600   |
| 39               | 41   |           |      | 85                | 2550         | 1415250   |
| 37               | 38   |           |      | 86                | 2580         | 1431900   |
| 34               | 36   |           |      | 87                | 2610         | 1448550   |
| 32               | 33   |           |      | 88                | 2640         | 1465200   |
| 29               | 31   |           |      | 89                | 2670         | 1481850   |
| 27               | 28   |           |      | 90                | 2700         | 1498500   |
| 25               | 26   |           |      | 91                | 2730         | 1515150   |
| 23               | 24   |           |      | 92                | 2760         | 1531800   |
| 20               | 22   |           |      | 93                | 2790         | 1548450   |
| 18               | 19   |           |      | 94                | 2820         | 1565100   |
| 16               | 17   |           |      | 95                | 2850         | 1581750   |
| 14               | 15   |           |      | 96                | 2880         | 1598400   |
| 12               | 13   |           |      | 97                | 2910         | 1615050   |
| 10               | 11   |           |      | 98                | 2940         | 1631700   |
| 8                | 9    |           |      | 99                | 2970         | 1648350   |
| 6                | 7    |           |      | 100               | 3000         | 1665000   |
| 4                | 5    |           |      | 101               | 3030         | 1681650   |
| 2                | 3    |           |      | 102               | 3060         | 1698300   |
| 1                | 1    |           |      | 103               | 3090         | 1714950   |

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